



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

oscillation as a whole would be but an incident in a series of climatic and oceanic changes which began with the opening of the Glacial period.

¹ Goldthwait, J. W., *Amer. J. Sci.*, **32**, 1911 (293).

² Twenhofel, W. H., *Ibid.*, **28**, 1909 (147); **30**, 1910 (66, 69).

³ Mayor, A. G., These *PROCEEDINGS*, **3**, 1917 (523).

⁴ Andrews, E. C., *New South Wales Handbook*, Brit. Assoc. Adv. Sci., 1914 (525, 532).

⁵ Süssmilch, C. A., *Introduction to the Geology of New South Wales*, Sydney, 1911 (154).

⁶ Cadell, H. M., *Trans. Edinburgh Geol. Soc.*, **7**, 1897 (179).

⁷ Brögger, W. C., *Norges geol. Unders.*, No. 31, 1901 (713), and No. 41, 1905.

A NOTE ON THE HUMAN SEX RATIO

BY C. C. LITTLE

CARNEGIE INSTITUTION OF WASHINGTON, COLD SPRING HARBOR, L. I., N. Y.

Communicated by R. Pearl, March 20, 1920

From data collected at the Sloane Maternity Hospital in New York City, it has recently been shown¹ that there is a significantly higher male sex ratio at birth among progeny whose parents are not of similar nationality. This result confirmed a paper published by the Pearls² in 1908, based on data derived from vital statistics of the City of Buenos Ayres, and had in addition a decreased source of error due to improved methods of recording the data and the inclusion of still births as well as living births in the calculations.

During the past year, a further study of the same records has been made concerning the sex ratio among the progeny of certain other types of matings and a preliminary attempt at analysis made by contrasting the sex ratios of the offspring of *primipara* with those of subsequent births.

Table 1 shows the sex ratios of five categories of matings: European "pure," European "hybrid," United States white, British West Indies colored, and United States colored. European pure are matings in which both parents were of the same nationality. European hybrids are offspring whose parents are of different nationality, United States white include a random sample of parents coming from various parts of the United States but preponderantly from the East and especially from New York State and New York City. British West Indies colored, are offspring from colored parents born in the British West Indies, and United States colored are offspring from colored parents born anywhere in the United States.

In each case the probable error of the ratio obtained has been calculated for the numbers observed. On the basis of these probable errors, the differences between the various ratios can be fairly compared with respect to their probable significance.

As has before been shown, there is a significant difference between the European "pure" and the European "hybrid" and between the former

and the United States white. There is, however, no significant difference between the European "hybrid" and the United States white. This shows that in the data studied, the United States white ratio is essentially that of a hybrid race.

TABLE I

	MALES	FEMALES	RATIO
(a) European Pure.....	2807	2689	104.54 \pm 0.97
(b) European Hybrid.....	677	551	122.86 \pm 2.14
(c) United States White.....	994	840	118.33 \pm 1.71
(d) British W. I. Colored.....	667	618	107.92 \pm 2.65
(e) United States Colored.....	695	723	96.12 \pm 1.76

COMPARISON	DIFFERENCE	DIFFERENCE
		PROBABLE ERROR OF DIFFERENCE
European Pure \times European Hybrid.....	18.32 \pm 2.35	7.8 Significant
European Pure \times U. S. White.....	13.79 \pm 1.9	7.2 Significant
European Pure \times B. W. I. Colored.....	3.38 \pm 2.82	1.2 Not significant
European Pure \times U. S. Colored.....	8.42 \pm 2.0	4.2 Significant
European Hybrid \times U. S. White.....	4.53 \pm 2.74	1.6 Not significant
U. S. White \times U. S. Colored.....	22.21 \pm 2.45	9.0 Significant
B. W. I. Colored \times U. S. Colored.....	11.80 \pm 3.18	3.7 Significant

This behavior of the United States matings is not in the least surprising for the number of different racial stocks involved in the production of the parents of the offspring recorded is undoubtedly large.

The British West Indies colored stock, while far from pure, is obviously more nearly so than the United States colored. This is true because of the fact that the United States colored in addition to including offspring whose grandparents were born in the United States, also admits the chance that part of the grandparents may have been themselves British West Indies stock, thus adding the hereditary variations of this stock to that of the United States colored stock. It is interesting to note that the ratio of the B. W. I. stock does not depart significantly from that of the European pure whites (see table 1). On the other hand, the United States colored differs significantly from both B. W. I. colored, and from European pure and United States whites.

We may, therefore, class our matings into two main groups—the European pure and the B. W. I. colored, as being relatively "pure" and the European hybrid, United States white, and United States colored as being relatively "hybrid."

Let us now examine the nature of the ratios when the progeny of *primipara* are separated from other births.

TABLE 2

	1ST BIRTHS				SUBSEQUENT BIRTHS				Difference of Diff.	Probable Error of Diff.
	♂♂	♀♀	♂♀	Ratio	♂♂	♀♀	♂♀	Ratio		
European Pure	1236	1070		115.51 \pm 1.5	1571	1614		97.33 \pm 1.18	18.18 \pm 1.86	9.7
B. W. I. Colored	313	302		103.64 \pm 2.75	354	316		112.02 \pm 2.76	8.38 \pm 3.9	2.1
European Hybrid	303	250		121.20 \pm 3.14	374	301		124.25 \pm 2.91	3.05 \pm 4.28	0.7
U. S. White	534	446		119.73 \pm 2.26	460	394		116.75 \pm 2.49	2.98 \pm 3.36	0.9
U. S. Colored	264	282		93.61 \pm 2.44	431	441		97.73 \pm 2.03	4.12 \pm 3.17	1.3

Table 2 shows that the three hybrid matings show a not significant difference between the sex ratio of offspring of *primipara* and those of subsequent births. On the other hand, there is a marked significance in the case of European pure matings and a barely possibly significant difference in the B. W. I. colored. The entire excess of male births in the total sex ratio of 104.54 in the European pure matings is found in the offspring of *primipara*—where 115.51 \pm 1.50 males to 100 females are found.

It is interesting to note that the negro matings in every case differ from one another in exactly the opposite direction from the white races. Thus if the direction of arrows shows the change in the *male* ratio the following diagram may be constructed: Single arrows = white, double arrows = colored.

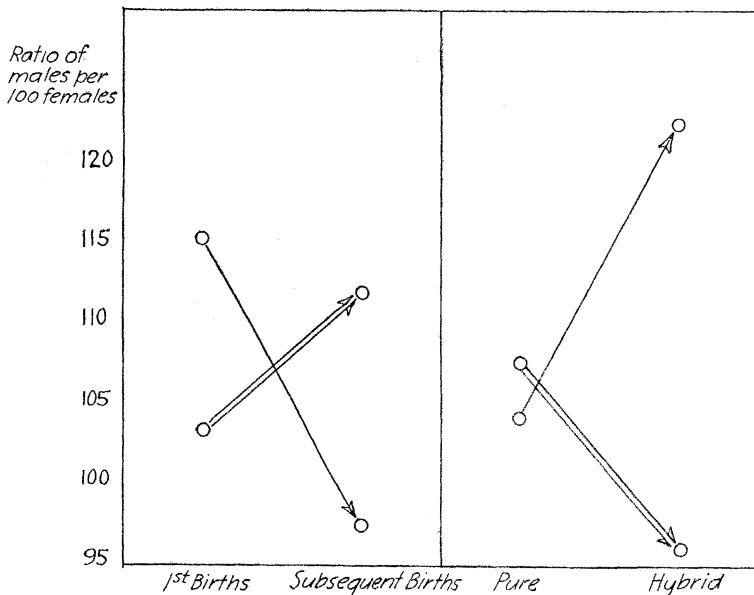


FIG. 1

The British West Indies colored race starting with a sex ratio of 103.64 ± 2.75 in the offspring of *primipara* shows in subsequent births a ratio of 112.02 ± 2.76 while in the European pure the ratio of first births is 115.51 ± 1.5 and subsequent births show a *decrease* of males; the ratio being 97.33 ± 1.18 .

So also the differences between "pure" and "hybrid" races are in the opposite direction in the colored and white races. The "pure" European have a sex ratio of 104.54 ± 0.97 and the European hybrids a ratio of 122.86 ± 2.14 —showing an *excess of males*. On the other hand the British West Indies colored which as we have seen is, compared with the United States colored, relatively the purer, has a ratio of 107.92 ± 2.65 , while the United States colored has a ratio of 96.12 ± 1.76 an *excess of females*.

It seems, therefore, that the following conclusions as regards material in the records of the Sloane Maternity Hospital of New York City, may be drawn as a guide for further investigations.

(1) Hybrid white matings give a significant *excess of males* over "pure" white matings.

(2) Hybrid colored matings give a significant *excess of females* over relatively "pure" colored matings.

(3) The difference between the sex ratio of the United States born whites and the United States born colored is nine times its probable error.

(4) In "pure" European matings the offspring of *primipara* have a sex ratio of 115.51 ± 1.5 , while the offspring from subsequent births have a ratio of 97.33 ± 1.18 . The difference is 9.7 times its probable error.

(5) In the hybrid matings studied no such difference between the sex ratio of offspring of *primipara* and of subsequent births exists.

(6) The sex ratios of the United States white births recorded is not significantly different from that of *hybrid* European matings.

¹ *Proc. Soc. Exp. Biol. Med.*, 1919.

² *Biol. Bull.*, 1908.

THE EXISTENCE OF HOMOGENEOUS GROUPS OF LARGE IONS

BY OSWALD BLACKWOOD

RYERSON LABORATORY, UNIVERSITY OF CHICAGO

Communicated by R. A. Millikan, March 12, 1920

The Zeleny mobility apparatus has been modified by the author so as to be capable of giving a decisive answer to the question as to whether the large ions produced by spraying distilled water are of many different sizes or whether—as claimed by certain observers¹—only a few different sizes are present in the ionization. In other words, is there a *continuous* spectrum of mobilities or a *line* spectrum? The investigation is fully described in an article which is about to appear in the *Physical Review*.

The mobility apparatus consists of a brass cylinder 160 cm. long and